Name _____ Period ____

Lab Partners _____

WATER POLLUTION TESTING

INTRODUCTION

In this lab, the levels of some major factors that lead to the pollution of streams, lakes, rivers, and ponds will be measured and studied. The actual amount of pollutants in these water sources plays a vital role in the biodiversity of aquatic organisms in nature. If levels of pollutants reach certain levels, the ability of specific organisms to reproduce and thrive is greatly dampened and in some cases even halted. If levels of pollutants become too highly concentrated, and certain species of individuals become scarce or even extinct, food chains could be altered. This, in turn, could change the structure of ecosystems as we know them today.

Water Pollution Indicators

pH: Scale with range of 0-14

- Neutral: pH equals 7
- Acidic: pH less than 7
- Basic: pH greater than 7
- Most aquatic organisms require pH range between 6.5 and 8.2

Dissolved Oxygen: One of most important indicators of overall health of body of water

- When levels drop below 3 ppm, fish and other organisms cannot survive
- High levels (6 ppm or more) supports the most diversity

Phosphate: Originates from fertilizers and wastewaters

- Levels higher than 0.03 ppm may lead to overgrowth of aquatic plants, which depletes oxygen and kills fish

Chlorine: Not naturally found in water (added to kill bacteria)

- Levels over 0.01 ppm can be fatal to aquatic organisms
- Drinking water levels are maintained under 0.75 ppm

Nitrate: Accumulate from decaying vegetation, the atmosphere, fertilizer, sewage

- Unpolluted water has a nitrate level less than 4 ppm (higher levels cause overgrowth of algae)
- Water with levels greater than 10 ppm is unfit to drink

PROCEDURES

pH Test

1. Fill the water sample tube to the 10-mL line with the water sample.
2. Add ONE pH Wide Range TesTab to the tube.
3. Cap the tube and mix until the tablet has dissolved.
4. Compare the color of the sample to the pH color comparison chart. Record the findings in the data table.
5. Dispose of the reacted sample in the sink and rinse the water sample tube.

Dissolved Oxygen Test

1. Fill a dissolved oxygen test vial to overflowing with the water sample.
2. Add **TWO** dissolved oxygen TesTabs to the vial.
3. Cap the vial and be sure that there are no air bubbles in the sample.
4. Invert the vial and mix until the tablets have dissolved.
5. Wait for about five minutes.
6. Compare the color of the sample to the Dissolved Oxygen color chart. Record the findings as parts per million in the data table.
7. Dispose of the reacted sample in the sink and rinse the vial.

Phosphate Test.

1. Fill the water sample tube to the 5-mL line with the water sample.
2. Add ONE Phosphorus TesTab to the tube.
3. Cap the tube and mix until the tablet has dissolved.
4. Wait for about five minutes.
5. Compare the color of the sample to the Phosphate color comparison chart. Record the findings as parts per million in the data table.
6. Dispose of the reacted sample in the sink and rinse the water sample tube.

Chlorine Test

1. Fill the water sample tube to the 5-mL line with the water sample.
2. Add ONE Chlorine DPD #4R TesTab to the tube.
3. Cap the tube and mix until the tablet has dissolved.
4. Compare the color of the sample to the Chlorine color comparison chart. Record the findings as parts per million in the data table.
5. Dispose of the reacted sample in the sink and rinse the water sample tube.

Nitrate Test

1. Fill the water sample tube to the 5-mL line with the water sample.
2. Add ONE Nitrate Wide Range TesTab to the tube.
3. Cap the tube and mix until the tablet has dissolved.
4. Wait for about five minutes.
5. Compare the color of the sample to the Nitrate color comparison chart. Record the findings as parts per million in the data table.
6. Dispose of the reacted sample in the sink and rinse the water sample tube.

DATA

Follow the directions for each test carefully and record your results below. Then, **using the water pollution indicators guide from the introduction**, decide whether you think the levels you found are considered healthy or unhealthy for each factor.

Color	pH	Acid/Neutral/Base	Healthy Or Unhealthy

Factor	Color	ppm	Healthy Or Unhealthy
Dissolved Oxygen			
Phosphate			
Chlorine			
Nitrate			

ANALYSIS QUESTIONS

Use your data and the information in the introduction to help you answer the following questions. You must EXPLAIN your answers for each question.

1. Could most aquatic organisms survive given the pH found in our water sample? Explain your answer.

2. Could fish survive given the dissolved oxygen levels found? Explain your answer.

3. Would the phosphate levels found lead to an overgrowth of aquatic plants? Explain your answer.

4. Could aquatic organisms survive given the chlorine levels found? Explain your answer.

5. Has the concentration of nitrogen of this sample reached unfit drinking levels? Explain your answer.

6. According to the various tests, would you describe the water sample to be polluted or non-polluted? Explain your answer.

7. Explain some of the consequences in an ecosystem if a body of water becomes polluted.

8. What are some possible sources of water pollution in your area?

9. What can be done to help minimize the amount of each pollutant in your local water sources? (Be specific)